



## **Ophiolite-type diamond: A new occurrence of diamond on the Earth**

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In the classic theory of plate tectonics, abyssal and ophiolitic peridotites are thought to originate in the shallow mantle beneath ocean spreading centers. Thus, they are highly different compositionally from kimberlite peridotites that come from much deeper levels, and commonly contain diamonds and other ultrahigh pressure (UHP) minerals. However, in the 1980s, diamonds and associated UHP minerals were reported from chromitites of the Luobusa ophiolite in southern Tibet. Because this finding was so unusual, these UHP minerals were originally considered by many to be the result of natural or anthropogenic contamination. Further study of this ophiolite has shown conclusively that both diamonds and other UHP minerals occur not only in the chromitites, but also in the host peridotites. Similar mineral assemblages have also been found in other ophiolites along the Neotethyan Yarlung Zangbo suture of southern Tibet, and in a Paleozoic ophiolite in the Polar Urals of Russia. Diamonds from these different localities all have very similar features, suggesting that UHP minerals may be widespread in most ophiolitic peridotites. These occurrences indicate a completely new environment for diamond formation, which can be regarded as ophiolite-type diamond. This environment is distinct from the other two well-known types, i.e. kimberlitic diamonds and UHP metamorphic diamonds. These new findings indicate a need to reconsider the nature of the upper mantle, the petrogenetic evolution of the melt column beneath the SSZ spreading centers, and the conditions under which ophiolites form.